

## 2.8

### Solving Inequalities in One Variable

#### **Polynomial Inequalities:**

Every polynomial inequality can be written in the form  $f(x) > 0$ ,  $f(x) \geq 0$ ,  $f(x) < 0$ ,  $f(x) \leq 0$  where  $f(x)$  is a polynomial. There is a fundamental connection between inequalities and the positive or negative sign of the corresponding expression  $f(x)$ :

To solve the inequality  $f(x) > 0$  is to find the values of  $x$  that make  $f(x)$  positive.

To solve the inequality  $f(x) < 0$  is to find the values of  $x$  that make  $f(x)$  negative.

If the expression  $f(x)$  is a product, determine its sign by determining the sign of each of its factors.

To sketch a graph of a polynomial use end behavior, multiplicity of real zeros, and a chart of signs.

Example 1, pg. 257

Finding where a Polynomial is Zero, Positive, or Negative

Example 2, pg. 259

Solving a Polynomial Inequality Analytically

Example 3, pg. 259

Solving a Polynomial Inequality Graphically

Example 4, pg. 260

#### **Rational Inequalities:**

Creating a Sign Chart for a Rational Function

Example 5, pg. 260

Designing a Box: Example 9, pg. 262-263